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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/988,417 | 11/16/2001 | Ralf Bohnke | 450117-03691 | 8530 |

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| EXAMINER | |
|---|---|
| KIM, KEVIN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2638 | |

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/988,417 | BOHNKE ET AL. | |
| | Examiner | Art Unit | |
| | Kevin Y. Kim | 2638 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *2-15 and 17-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6-8,14,15 and 18-26* is/are rejected.

7)☒ Claim(s) *2-5,9-13 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to claims 21-26 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 6, 7, 14, 18, 19, 21-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Greenstein et al (US 6,131,016).

Claim 21.

Greenstein et al discloses a method for transmitting signals using a plurality of subcarriers through a plurality of antenna elements (16,17) in a wireless transmission system (i.e. OFDM), comprising the steps of:

detecting channel response vectors corresponding to the plurality of antenna elements, wherein each of the channel response vectors includes subcarrier related elements corresponding to the plurality of subcarriers (see col.4, line 53 ~ col.5, line 37 describing the obtaining of various channel response vectors) and

adjusting transmission characteristics of the plurality of subcarriers in accordance with amplitude and/or phase of at least one of the detected channel response vectors (see col. 4, lines 5-12).

Claim 22.

Greenstein et al discloses a method for transmitting signals using a plurality of subcarriers in a transmission system, comprising the steps of:

generating the signals by using a plurality of antenna elements (16,17),

detecting vector elements indicating channel transmission characteristics of the plurality of subcarriers at each of said plurality of antenna elements (see col.4, line 53 ~ col.5, line 37 describing the obtaining of various channel response vectors and col. 4, lines 49-52 describing the transmission characteristics can be done at the transmission antenna) and

adjusting transmission characteristics of the plurality of subcarriers in accordance with amplitude and/or phase of at least one of the detected channel response vectors (see col. 4, lines 5-12).

Claim 23.

Greenstein et al discloses a method for transmitting signals using a plurality of subcarriers in a transmission system, comprising the steps of:

generating the signals by using a plurality of antenna elements (16,17),

detecting vector elements indicating channel transmission characteristics of the plurality of subcarriers at each of said plurality of antenna elements (see col.4, line 53 ~ col.5, line 37

describing the obtaining of various channel response vectors and col. 4, lines 49-52 describing the transmission characteristics can be done at the transmission antenna) and

adjusting amplitudes and phases of plurality of subcarriers based on channel response vectors indicating channel transmission characteristics of the plurality of subcarriers at each of said plurality of antenna elements. See col.5, lines 30-33.

Claim 24.

Greenstein et al discloses a method for transmitting OFDM symbols by using a plurality of OFDM subcarriers in an OFDM transmission system, comprising the steps of:

generating the OFDM signals to be transmitted (see col. 3, lines 35-37) by using a plurality of antenna elements (16,17),

obtaining channel response vectors corresponding to the plurality of antenna elements, wherein each of the channel response vectors includes subcarrier related elements corresponding to the plurality of subcarriers (see col.4, line 53 ~ col.5, line 37 describing the obtaining of various channel response vectors), and

applying weighting value to each of said plurality of subcarriers in accordance with a complex conjugate of the channel response vectors. See col.5, lines 30-33.

Claims 14, 18, 19, 20, 25 and 26.

Greenstein et al discloses a method and apparatus for transmitting an orthogonal frequency division multiplex (OFDM) signal by using a plurality of antenna elements (16,17) at

a base station (10) in a wireless transmission system, wherein the OFDM signal comprises a plurality of subcarriers, comprising:

detecting frequency channel characteristics of each subcarrier of the OFDM signal for each of said plurality of antenna elements (see col. 4, line 20 ~ col. 6, line 10),

adjusting at least one of the amplitude and phase of each subcarrier in accordance with the detected characteristics of the corresponding subcarrier frequency channel or all subcarrier frequency channels (see col. 4, lines 1-12), and

transmitting the OFDM signal by using the adjusted subcarriers via said plurality of antenna elements.

It should be noted that the down link tones are grouped into subsets of M consecutive tones (where M is an odd number) such that Mx(tone spacing) is less than the correlation band. An extreme case is that each tone is selected as a pilot tone, thus meeting the limitation of "detecting frequency channel characteristics of each subcarrier of the OFDM signal." See col.5, line 45 ~ col.6, line 10.

Claim 6.

Greenstein et al discloses selecting an antenna element having the best channel characteristics. See col. 4, line 59 ~ col.5, line 7.

Claim 7.

Greenstein et al discloses distributing the power of the transmission signal to all of the antennas according to subcarrier frequency characteristics of a corresponding antennal element. See col. 5, lines 24-37.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greenstein et al (US 6,131,016), as applied to claim 25 above, in view of Minami et al (US 6,587,510).

Greenstein et al discloses all the subject matter claimed, as explained above, but for limiting an adjustment of the magnitude of the subcarrier signal to an upper threshold.

Minami et al teaches limiting the adjustment of transmission power to an upper threshold for the purpose of maintaining a proper carrier to interference ratio. See col. 6, lines 15-25. Thus, it would have been obvious to one skilled in the art at the time the invention was made to limit an adjustment of the magnitude of the subcarrier signal to an upper threshold when the amplitude is adjusted in response to detected channel characteristics in the system of Greenstein et al for the purpose of maintaining a proper carrier to interference ratio, as taught by Minami et al.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greenstein et al (US 6,131,016), as applied to claim 25 above, in view of Ocenasek et al (US 6,674,324).

Greenstein et al discloses all the subject matter claimed, as explained above, but for a computer software program configured to implement the method defined in claim 25 when run on a computing device of a transmitting device. However, a software implementation of a method performed by a hardware, using a program and a computer, is notoriously well known in

the art, as evidenced by Ocenasek et al describing a device in the same field of endeavor (see col. 15, lines 35-44) and thus would have been obvious to one skilled in the art at the time the invention was made as an alternative implementation.

### *Allowable Subject Matter*

7. Claims 2, 3, 4, 5, 9-13 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Conclusion*

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y. Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 3, 2006

/Kevin Kim/

KEVIN KIM
PATENT EXAMINER